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been prolonged backward to the Ordovician, in consideration of Mr. C. D. Walcott's genera *Astraspis* and *Eriptychius*.

In contrast with the elasmobranchs the actinopterous fishes, which entered on their career as 'a feeble folk' in the Devonian, seem hardly to have held their own during the Subcarbonian. Their numbers increased slowly during the Carbonian, they then expanded rapidly during the Mesozoic. The slight fall in the number of known species during the Tertiary does not probably indicate an actual reduction in the number of species that then lived. In the waters of the region here contemplated there are now living probably at least 1500 species of this group of fishes.

O. P. HAY.

THE INTERNATIONAL ASSOCIATION OF
ACADEMIES.*

For several years past there has existed an Association or Cartell of the Academies of Sciences of Munich and Vienna, and of the Royal Societies of Sciences of Göttingen and Leipzig, which has met yearly to discuss matters of common interest, and the combined action of these bodies has in several ways been fruitful of results. Representatives of the Royal Society of London attended the meeting held last year at Göttingen, as well as that which took place the previous year at Leipzig, chiefly with the object of discussing the project of an international catalogue of scientific literature which the Society has been engaged in promoting.

When the invitation was conveyed to the Royal Society of London to send representatives to the Göttingen meeting, it was intimated that the Cartell would be glad to learn the views of the Society as to the possibility of its joining the Association. The delegates appointed from London were instructed to state that the Royal Society

would be disposed to join, provided that the organization were so extended as to assume a truly international character. This suggestion was not only accepted in principle at Göttingen, but it was agreed that the Royal Society of London should be requested to take the steps, if thought desirable, to ascertain how far the establishment of such an international association would commend itself to the leading scientific bodies of other countries.

The Royal Society of Sciences of Berlin, although not included in the Cartell, has for several years past been represented at its meetings. When the Royal Society of London had ascertained that the project was likely to find favor, it was agreed that the Royal Society and the Berlin Academy should together issue an invitation to the Academy of Sciences, Paris, the Imperial Academy of Sciences, St. Petersburg, the Reale Accademia dei Lincei, Rome, the National Academy, Washington, as well as to the bodies included in the Cartell, requesting them to send delegates to a conference to be held in Wiesbaden on the 10th and 11th of October.

At the conference, excepting the Reale Accademia dei Lincei, which was unable to send delegates, although in full sympathy with the movement, all the bodies invited were represented—the Berlin Academy by Messrs. Auwers, Virchow, and Diels; the Göttingen Society by Messrs. Ehlers and Leo; the Leipzig Society by Messrs. Windisch and Wislicenus; the Royal Society by Messrs. Rücker, Armstrong, and Schuster; the Munich Academy by Messrs. von Zittel, Dyck and von Sicherer; the Paris Academy by Messrs. Darboux and Moissan; the St. Petersburg Academy by Messrs. Famintzine and Salemann; the Washington Academy by Messrs. Newcomb, Remsen, and Bowditch; and the Vienna Academy by Messrs. Mussafia, von Lang, Lieben, and Gomperz.

* From the London Times.

Professor Auwers one of the secretaries of the Berlin Academy, occupied the chair, and the success of the meeting was largely due to the extreme ability and tact, combined with judicious firmness, with which he conducted the proceedings. Besides showing himself a master of the three languages—German, French and English—used in the debates, he was thoroughly informed on every point which came up for discussion. Fortunately, all the delegates appeared to be actuated by the desire to coöperate, and there was little difficulty in framing statutes which all were prepared to accept.

The immediate outcome of the conference has been that it is resolved to found an international union of the principal scientific and literary bodies of the world, the object of which will be to initiate or promote scientific enterprises of general interest recommended by one or more of the associated bodies, and to facilitate scientific intercourse between different countries. It is to be known as the International Association of Academies. A number of important bodies besides those represented at Wiesbaden are to be invited to join. General meetings of delegates from the various constituent academies are to take place, as a rule, at intervals of three years, but the interval may be varied and special meetings held, if necessary. The Royal Society had proposed, prior to the conference, that the first general meeting should be held in Paris next year. At the general meetings two sections will be constituted, one dealing with mathematics and the natural sciences, the other with arts and philosophy.

A council is to be appointed which will carry on the business in the intervals between meetings. The formation of committees of experts to initiate and promote scientific investigations of international importance is also contemplated.

It remains to be mentioned that the Ber-

lin Academy had also arranged for the entertainment of the delegates at the close of the debates. On the Monday evening they were invited to attend a performance of Lortzing's opera *Undine*, and on the Tuesday they were entertained at dinner in the Kurhaus. On the latter occasion Professor Virchow occupied the chair, and opened the proceedings by toasting the delegates generally; he was followed by Professor Darboux, of Paris, who proposed the health of the Berlin Academy, and in the course of the evening numerous other toasts were proposed by the delegates.

SCIENTIFIC BOOKS.

The Kinetic Theory of Gases. By S. H. BURBURY. Cambridge University Press. 1899. Pp. 157.

Mr. Burbury has long been known as an occasional contributor to the Kinetic Theory of Gases. The first edition of Watson's treatise on this subject, published in 1876, acknowledged the indebtedness of its author to him; and in that very interesting discussion of the Kinetic Theory which was begun at the Oxford meeting of the British Association in 1894 and continued for months afterwards in *Nature*, Mr. Burbury took a conspicuous part, appearing as the expounder and defender of Boltzmann's *H*-theorem in answer to the question which so many have asked in secret, and which Mr. Culverwell asked in print, '*What is the H-theorem and what does it prove?*' Thanks to this discussion, to the more recent publication of Boltzmann's *Vorlesungen über Gas-theorie*, and finally to this treatise by Burbury, this question is not so difficult to answer as it was a few years ago; but it is probable that some readers of SCIENCE, even to this day, know less about the *H*-theorem than is contained in the following sketch of its history, which will serve to bring out one of the most interesting features of the book before us:

In 1860 Maxwell deduced from the laws of probability an expression for the final distribution of components of velocity among the particles of a gas consisting of very small elastic spheres having no action upon each other ex-